

Process Notes



The Myth of the 1000°F Vacuum Unit Cutpoint

Canadian Synbit and Dilbit crudes will come to make-up a substantial fraction of feedstocks to North American refineries. Today, however, for the most part refiners both north and south of the 40° parallel seem to be unaware of the extreme challenges this change will present. To run an oil sands crude in a vacuum unit designed for conventional heavy feedstocks and to expect a 1000°F cutpoint for a 5-6 year run is like believing in the Tooth Fairy. Bitumen based

crudes are ultra-heavy, fouling, hard to desalt, corrosive, thermally unstable and tough to vaporize in the vacuum column flash zone even at elevated temperatures. Can any crude oils be nastier to cope with?

First and foremost, heater outlet temperature can be no higher than 725°F and possibly lower to avoid extremely high cracked gas rates and rapid coke lay-down. Even at these reduced temperatures the heater tubes must be double-fired, coil steam rates high, coil layout correct, oil mass velocity high and heater outlet pressure selected properly. But won't lower heater outlet

temperature increase the coker charge rate by 25% or more? Yes ...with current unrealistic vacuum column design! The proper design is one which can provide minimum coker charge with design features that incorporate efficient residue stripping and low column operating pressure.

If you design your vacuum unit correctly you can indeed expect to achieve a 975°F VGO cutpoint and a 5-6 year run length. But it won't come from conventional cheap unit designs. If the wrong designs are used it could mean replacing the heater, having to add residue stripping and new ejector systems. The revamp can cost 40% of a new unit. The choice is yours. Pay now or pay through the nose later.

A last word: Because process and equipment design is critical when processing oils sands crudes, know-how and actual experience designing units to process these feedstocks can make the difference between success or possibly disastrous reliability and yields.



For a more thorough discussion of cutpoint ask for Technical Papers 236 and 237.



**PROCESS
CONSULTING
SERVICES, INC.**

3400 Bissonnet
Suite 130
Houston, Texas 77005
USA

Ph: [1] (713) 665-7046
Fx: [1] (713) 665-7246
info@revamps.com
www.revamps.com